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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,676	12/06/2001	Ramesh Subramanian	01P23114US	8645

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EXAMINER

MARCANTONI, PAUL D

ART UNIT	PAPER NUMBER
1755	

DATE MAILED: 02/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/010,676	SUBRAMANIAN, RAMESH	
	Examiner	Art Unit	
	Paul Marcantoni	1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: |

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Applicant's arguments filed 12/17/03 have been fully considered but they are not persuasive.

Note: The rejection below of claims 1 and 10 over art previously cited (with the exception of Maloney 200 B1 would be promptly withdrawn should applicants insert the limitation of at least 30wt% yttria and at least 30% gadolinia in claims 1 and 10 respectively.

102/103 Rejections:

Claim 1 and 10 are rejected under 35 U.S.C. 102(a and b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Stecura, Jacobsen, Watanabe et al. '138, Pitts, or Kondo et al. '330.

For all the references listed above, it is noted that it is understood in the art that zirconia contains incidental impurities such as hafnia or hafnium oxide and thus any composition that contains zirconia naturally contains some hafnia. Applicants do not specify in their independent claim 10 the *amount or range of amounts* of hafnia so it can be inferred that the hafnia that is present with the zirconia is also present in the cubic crystal structure.

Stecura '033 teaches a composition comprising zirconia with cubic phase that contains up to 25 wt% ytterbia. Increasing amounts of ytterbia decrease the number of thermal cycles. This would also thus appear to anticipate the instant invention (see cover of patent referring to the Figure of Cycles to Failure vs. ytterbia concentration).

Jacobsen '071 teaches a cubic zirconia phase that is maintained by adding from 1 to 15 wt% of a stabilizer such as yttrium oxide and would appear to anticipate the instant invention. Note that applicants' independent claims contain no amounts and at the very least this reference reads upon these claims. Further, the fact that salts of yttrium are used is of no matter because upon combustion the salts become yttrium oxide so the end result is exactly the same. Jacobsen '071 further teaches that it is old and known in the art that if one of ordinary skill in the art wants a cubic phase, it is suggested to add higher concentrations of stabilizer. Thus, applicants addition of high amounts of stabilizer to maintain the cubic phase is not a new concept.

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Watanabe et al. '138 teach a cubic phase zirconia comprising a stabilizer such as yttria and ytterbia (col.4, lines 20-25). Watanabe further teaches that the cubic system is formed at "16 mol% or more" which meets the applicants' claim limitations of at least 30 wt% of stabilizer (see col.4, lines 29-34).

Kondo et al. '330 teach cubic phase zirconia comprising 0.1 to 40 wt% stabilizer such as yttria, gadolinia, or ytterbia (see col.3, lines 5-15) thus anticipating the instant invention.

Note that even if the references above do not anticipate, overlapping ranges of amounts have been held to be prima facie obvious to one of ordinary skill in the art.

Pitts teaches cubic zirconia with a stabilizer that would appear to be within the applicants claim range. Note that even if the references above do not anticipate, overlapping ranges of amounts have been held to be prima facie obvious to one of ordinary skill in the art.

The following new grounds of rejection have been made as a result of the discovery of new prior art:

Claims 1-14 are rejected under 35 U.S.C. 102(a and b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Maloney 200B1, Worrell et al. 214, Mase et al. '394, Rangaswamy et al. '270, Strangman et al. '537B1, or Fehrenbacher '113.

Maloney 200 B1 teaches a zirconia coating comprising 5-60 mol% gadolinia and the rest zirconia which also leads to a cubic crystal structure and would appear to anticipate the instant invention (see claims).

Worrell et al. teach a composition comprising 25-98 mol% of cubic zirconia and 1.5 to 25 mol% of stabilizer oxide such as yttrium oxide or yttria. Note that in claim 10 20 mol% yttrium oxide is 37 wt% yttrium oxide so thus the Worrell et al. composition anticipates the instant invention. Further, although Worrell et al. do not teach the same

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intended use as a coating, the new use of a known composition is not a patentable distinction.

Mase et al. teach a composition comprising zirconia and/or hafnia and rare earth oxides in amounts anticipating the instant invention (see claims). Although, Mase et al. do not teach the intended use as a coating, the new use of a known composition is not a patentable distinction.

Rangaswamy et al. teach a coating composition comprising hafnium oxide (even if present as an impurity-col.1, line 54) and about 23-29 wt% cerium oxide (rare earth oxide) thus anticipating the instant invention. This at least meets the limitation of claim 10 because hafnia is present with zirconia ⁱⁿ cubic form and the amount of rare earth oxide meets the amounts of claim 10.

Strangman et al. teach a coating composition comprising cubic zirconia stabilized with 6 to 25 wt% yttria thus anticipating the instant invention.

Fehrenbacher teaches a composition comprising zirconia and/or hafnia and rare earth oxides that thus anticipate the applicants' instantly claimed invention. This reference is especially relevant to claim 10 because it teaches hafnia with rare earth oxide stabilizer. This reference can be overcome if applicants place gadolinia into claim 10 as well as the specific range of amount of this stabilizer (ie at least 30 wt%).

35 USC 112 First and Second Paragraph:

Claims 1-14 are rejected under 35 U.S.C. 112, first and second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention and lacking an enabling disclosure.

Applicants' independent claims contain no amounts that lead to the condition of a peak ionic conductivity in the matrix. The specification requires that an amount of at least 30 wt% stabilizer is required in all cases and it would appear necessary for applicants to incorporate this limitation into all independent claims.

The applicants also do not particularly point out and distinctly claim the amounts critical to obtain their properties of peak ionic conductivity in the matrix which is necessary by having at least 30wt% stabilizer.

Claims 1-14 are also indefinite because it is improper to claim a coating without a substrate. Applicants should amend their claim to either a coating on a substrate or a coating composition. Ex parte Scott 66 USPQ 371. Applicants can resolve this by amending all of their claims in the preamble from *coating material* to coating composition.

Response:

Applicants did not respond to the rejection of claims 1-14 over the first and second paragraph of 35 USC 112. Applicants are required by their own specification to include a cubic yttria stabilized zirconia having at least 30 wt% yttria or a halfnia

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stabilized with at least 30% gadolinia. This amount must be in independent claims 1 and 10 respectively in order to overcome the rejection over the first paragraph of 35 USC 112. The applicants' claimed invention is not commensurate in scope with the invention of their enabling disclosure and thus the problem.

Applicants also fail to particularly point out and distinctly claim their invention which must have a yttria stabilized zirconia and gadolinia stabilized hafnia in an amount of at least 30 wt%. Without this amount in the independent claims, it is indefinite for one of ordinary skill in the art to determine what amount actually leads to this result that when the concentration of rare earth oxide (ie yttria or any other rare earth oxide) is greater than that of the concentration of the peak ionic conductivity of the matrix. This rejection over 35 USC 112 first and second paragraph remains until applicants insert the limitation found in claims 2 and 12 into independent claims 1 and 10 respectively.

The applicants argue that neither Pitts, Maloney '200B1, Stecura, Jacobsen, Watanabe et al. '138, or Kondo et al. '330 teaches an amount of at least 30 wt% yttria. The examiner agrees yet only for the claims that actually teach an amount "of at least 30 wt%. This does not include claim 1 which contains "no" amounts of yttria but merely a property that by using a specific amount of yttria a peak ionic conductivity would result in the matrix." Further, it is noted that all these references still teach an amount of yttria added to zirconia that could result in a peak ionic conductivity in the matrix. Where is the applicants' experimental evidence that the amounts below 30% would not lead to peak evidence? Note that if applicants do present evidence of this that they make the

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argument as to why their amount of at least 30 wt% yttria must be in their independent claim 1.

It is apparent that the applicants are arguing limitations into their claims which are not there and this is improper. There is no amount of at least 30 wt% presently in claim 1 and thus applicants cannot argue a limitation not actually in the claim. While it is true that the claims may be read in light of the specification, it is improper to read the limitations of the specification into the claims. In re Yamato, 222 USPQ 93; In re Wilson, 149 USPQ 523; Graver Tank v. Linde Air Products Co. 80 USPQ 451 (Supreme Court).

The applicants are also reminded that not only are they arguing limitations they do not have in their independent claim(s) but they themselves have not shown that they can actually achieve a peak ionic conductivity in the ceramic zirconia matrix "below 30 wt%" yttria. The applicants' own specification provides absolutely no examples or literal support that they have support for virtually *any* amount of yttria in claim 1 (or gadolinia or other rare earth-see claim 10) that they wish. This clearly cannot be within the scope of applicants' invention.

Also, if the applicants did have support for any weight percent yttria below 30 wt%, they would have to show an amount covering the lower limit (near zero percent and data points up to 30 wt%). This was not done and there is no evidence of such a finding anywhere in the specification. Therefore, since applicants do not have results below 30% and their own specification stresses that the amounts of yttria must be at least 30 wt%, why are applicants trying to claim a range that not only contradicts their

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disclosure and their own arguments which note the prior art amounts fall below 30 wt% yttria?

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Marcantoni whose telephone number is 571-272-1373. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at 571-272-1362. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul Marcantoni
Primary Examiner
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